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INT. CL.⁵ H01H1/, H04L13/

APPLICANT SIEMENS AKTIENGESellschaft

DATE OF APPLICATION 27/6/'90

SUBJECT Safety connector for a distributor strip
in a telecommunication system

The safety connector is provided with fork-shaped spring contacts, the lateral legs of which are cut free from flat material and which can be deflected resiliently in the material plane. With their spring ends they plunge into slit-like recesses of a housing of the safety connector.

Surge voltage protectors are provided with pin-like, radially projecting connector pins which can be plugged in between the legs of the spring contacts.

The distributor strip is simple to produce and can be of compact design.

Earliest Priority Date

28/6/'89

Application Number

2328/90

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PATENTS ACT, 1964

COMPLETE SPECIFICATION

COMMUNICATION
CABLE

EXHIBIT COPY
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LODGED

INT CL ⁵ H01H 11/
H04L 13/-

SAFETY CONNECTOR FOR A DISTRIBUTOR STRIP IN A TELECOMMUNICATION SYSTEM

OPEN TO PUBLIC INSPECTION
UNDER
SECTION 69 AND RULE 117
NL NO. 1647 OF 16/1/91

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27/6/90

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Safety connector for a distributor strip in a telecommunications system

- 5 The invention relates to a safety connector for a distributor strip in a telecommunications system, preferably telephone system, the oblong safety connector having a plurality of transverse contiguous surge voltage protectors.
- 10 A safety connector of this type has been disclosed, for example, by DE 3,014,796 C2. According to the latter (Figure 3), the connector pins of three-pole surge voltage protectors can be plugged in between the legs of spring contacts, bent over on themselves in a U-shape, of
- 15 a safety connector for a distributor strip. The spring contacts are open towards the surge voltage protector and their base is arranged on the side remote from the surge voltage protectors. Centring bores for the connector pins are arranged in the housing of the safety connector
- 20 between the spring contacts and the surge voltage protectors. The spring contacts are part of contact parts which terminate in plug-in contact tongues with which the safety connector can be plugged into a distributor strip. In its contact arrangement, the contact part takes the
- 25 form of a T, the two lateral legs being bent towards the surge voltage protectors.

The object of the invention is to permit the inexpensive production and installation of the contact parts.

- 30 This object is achieved by the invention according to Claim 1. According to the latter, the spring legs can now be formed out in one work step together with the cutting out of the contact parts. The geometry of the spring contact is precisely defined by the cutting punch, so that contact conditions always remain constant.

When the connector pins of the surge voltage protectors are plugged in, these are guided laterally in the slit-like recess, so that they are reliably guided between the spring legs of the spring contact. By virtue of the simple flat geometric form of the spring contacts, the latter can be inserted more easily into the housing of the safety connector, which in particular favours automation of assembly.

According to a further development of the invention, the material plane of the spring contacts extends in the longitudinal direction of the safety connector and the clearances take the form of continuous longitudinal slits. The safety connector can consequently be kept very narrow. In terms of production technology, a continuous recess is simple to produce. The contact springs are parallel to the plug-in tongues, so that the contact parts can be produced either flat or with simple bends.

According to another further development of the invention, the surge voltage protectors are of three-pole design, the spring contacts for the middle poles of the surge voltage protectors are integrally connected to an earthing plate running through lengthwise and standing in the plug-in direction, and they lie in the material plane of said earthing plate.

An earthing plate of this type can be stamped out in one piece together with the spring contacts. It does not require any bends and can thus be inserted exactly into the housing of the safety connector.

Other further developments of the invention are characterized in Claims 4 to 8.

By virtue of the further development according to Claim 4, the end-face connector pins of the surge voltage protectors can already be aligned with the grooves at the outer edge of the receiving compartment with exact visual

monitoring. Since in the region of the grooves the connector pins bulge outwards in the shape of an arc, they engage with a sufficient length into the guide grooves so that, when inserted, the surge voltage protectors can also be aligned in their angular position with the spring contacts. In this way the connector pins are plugged in reliably between the spring contacts.

Since the grooves only take up a narrow width in accordance with the diameter of the thin connector pins, the stiffness of the outer walls is reduced only slightly. That is to say, in the region of the groove the outer wall can be kept very thin. The groove thus at the same time represents a clearance for the connector pin, which makes it possible to reduce the overall width of the safety connector to a minimum. Since the width of the distributor strips, the latter can be arranged with a small spacing distance.

The cover according to Claim 5 can be simply placed onto the operating side of the safety connector. The pre-tension, the thickness and the spring properties of the cover can be matched to one another so that it fits snugly on the safety connector. A locating means in the middle of the safety connector is thus not required. This means that the overall width of the safety connector with the cover need not be enlarged for retaining means on the longitudinal side. In turn this means that the distributor strip can be kept correspondingly narrow so that the overall installation width is reduced. The measures for anchoring at the end faces do not however increase the overall length of the safety connector. The pre-tension can be achieved, for example, if the operating side of the safety connector has a convex curvature in its longitudinal direction.

Since no great force is necessary for affixing the cover, the anchoring means can be designed to be correspondingly

5 thin and easily releasable, e.g. as detent noses. This facilitates the opening and closing of the cover. The detent means can act in the longitudinal direction of the safety connector and hence utilize the pliability of the cover.

10 By virtue of the further development according to Claim 6, the top side of the safety connector can remain straight, so that all compartments are equal and all surge voltage protectors can be exchanged under the same geometric conditions. This facilitates the operating work. The cover can be produced in a simple manner, for example in an appropriate curved injection mould. However, it is also possible to produce the cover in straight injection moulds and to generate the curvature by special technical casting measures, for example with respect to the gate marks. In addition, a cover made by straight injection moulding can be subsequently provided with the envisaged curvature by deformation.

20 By virtue of the further development according to Claim 7, it is possible to snap the cover simply onto the safety connector. It can be released just as simply by pulling it up in the middle region of the safety connector so that the locating means at the end face is released. It is possible to pull it up simply with bare fingers, without a tool being necessary for releasing. This considerably facilitates the checking and operating work.

30 By virtue of the further development according to Claim 8, the cover is captively held and guided on the safety connector. As a result, the receiving compartments for the surge voltage protectors can be closed again by simply snapping the cover shut.

35 The invention will be described in greater detail below with reference to an exemplary embodiment illustrated in the drawing, in which

Fig. 1 shows a cross-section through a safety connector for a distributor strip with surge voltage protectors,

5 Fig. 2 shows a longitudinal section through the safety connector according to Figure 1 in accordance with line II-II in Figure 3,

Fig. 3 shows a plan view of the safety connector according to Figure 2,

10 Figs. 4 and 5 show a side view and another plan view of the safety connector with a cover.

According to Figures 1, 2 and 3, a safety connector 1 has a housing 2, an earthing plate 3 and contact parts 4. The housing 2 is provided with receiving compartments 5 for three-pole surge voltage protectors 6. The latter have
15 radially projecting connector pins 7 which can make contact with the contact parts 4 and the earthing plate 3. The contact parts 4 terminate on the side remote from the receiving compartments 5 in plug-in tongues 8, which can be plugged into counter-contacts of a distributor
20 strip, not shown. Said counter-contacts are connected, for example, to subscriber lines. An electrical connection thus exists between the latter and the surge voltage protectors 6.

The surge voltage protectors 6 are arranged contiguously
25 transversely in the longitudinal direction of the safety connector 1. In each case the two end-face connector pins 7 of the cylindrical surge voltage protectors 6 make contact with the contact parts 4. The middle connector pin 7 is connected to the earthing plate 3, so that
30 overcurrents occurring in the subscriber lines can be earthed.

In the region of the connector pins 7, the contact parts 4 and the earthing plate 3 take the form of fork-shaped spring contacts 9. The legs of the spring contacts 9 are
35 cut free from the flat material of the contact parts 4 and can be deflected in the material plane. With their

spring ends they plunge into slit-like recesses 10 of an intermediate base 11 of the housing 2. The recesses 10 take the form of continuous longitudinal slits which are slightly wider than the diameter of the connector pins 7. As a consequence, the latter are guided laterally between the legs of the spring contacts 9 when pushed through centring bores in the intermediate base 11.

At its base, the strip-shaped earthing plate 3 is inserted into and guided in fork-shaped projections 12 of the housing 2. The contact parts 4 and the earthing plate 3 extend with their material planes essentially in the longitudinal direction of the safety connector 1 so that the latter can be kept correspondingly narrow.

The end-face connector pins 7 are fixed axially to the surge voltage protectors 6 and are bent out in the manner of an arc in radial direction. The intermediate base 11 between the surge voltage protectors 6 and the spring contacts 9 is provided with centring bores 13 for the connector pins 7. Outer walls 14 of the receiving compartments 5 have grooves 15 of rectangular cross-section extending in the plug-in direction. Said grooves are open towards the receiving compartment and towards the plug-in side and point in the direction of the spring contacts 9. With their arc-shaped section the connector pins 7 project into the grooves 15 and are held therein in the correct position. When plugging-in, therefore, the ends of the connector pins 7 are aligned precisely with the centring bores 13 and hence with the spring contacts 9. This makes it possible to insert the surge voltage protectors 6 into the safety connector 1 manually without effort and without any aids whatsoever.

According to Figures 4 and 5, the receiving compartments 5 can be closed by a cover 25. The latter is of spring-elastic design and in the open state is convexly curved in itself towards the safety connector 1. On one end face it is provided with a moulded-on pivot pin 26

which latches into and is pivotably mounted in the housing of the safety connector 1. On the other end face, an outwardly pointing detent nose 27 is provided on the flat thin cover, which detent nose, in the closed state, engages from the inside behind a corresponding end-face outer wall 28 of the safety connector 1. When the cover 25 is snapped shut, as a result of the negative pre-tensions it fits snugly and flat against the top side of the safety connector 1 so that the receiving compartments 5 can be closed away from the danger of touching.

Patent Claims

1. Safety connector for a distributor strip in a telecommunications system, preferably telephone system, the oblong safety connector (1) having a plurality of transverse contiguous surge voltage protectors (6) with wire-like connector pins (7) projecting in one direction which can be plugged in in each case between two legs of a spring contact (9) of the safety connector (1), the spring contacts (9) being connected with plug-in tongues (8) that can make contact with counter-contacts of the distributor strip, and the housing (2) having between the surge voltage protectors (6) and the spring contacts (9) an intermediate base (11), through which the connector pins (7) can be plugged, characterized in that the spring contacts (9) take the form of fork contacts, the legs of which are cut free from flat material and can be deflected in the material plane, in that the free ends of the legs project into slit-like recesses (10) of the intermediate base (11), and in that the slit-like recesses (10) are slightly wider than the connector pins (7) are thick.

2. Safety connector according to Claim 1, characterized in that the material plane of the spring contacts (9) extends in the longitudinal direction of the safety connector (1), and in that the recesses (10) take the form of continuous longitudinal slits.

3. Safety connector according to Claim 1 or 2, characterized in that the surge voltage protectors (6) are of three-pole design, and in that the spring contacts (9) for the middle connector pins (7) of the surge voltage protectors (6) are integrally connected to an earthing plate (3) running through lengthwise and standing in the plug-in direction, and they lie in the material plane of said earthing plate.

4. Safety connector for a distributor strip in a telecommunications system, preferably telephone system, in which the oblong safety connector (1) can be equipped with transverse cylindrical surge voltage protectors (6)

contiguous in its longitudinal direction and which can be inserted at right angles to the equipping side into at least one receiving compartment (5) of a housing (2) of the safety connector (1), and, with connector pins (7) projecting radially in one direction, can thereby be plugged into spring contacts (9) of the safety connector (1), and in which the connector pins (7) can be fixed axially to the end faces of the surge voltage protectors and be bent out from there in arc-shaped manner in the radial direction, that grooves (15) open towards the surge voltage protectors (6) and extending in the plug-in direction are let into the longitudinal-side outer walls (14) of the receiving compartments (5), into which grooves the connector pins (7) project at least partially and which point in the direction of the spring contacts (9).

5. Safety connector, in particular according to Claim 4, characterized in that the receiving compartments can be closed by means of a pliable cover (25), and in that the cover (25) can be anchored at both end faces to the safety connector, and in the anchored state rests against the safety connector (1) under pre-tension in the middle between the two end faces.

6. Safety connector according to Claim 5, characterized in that the cover (25) is convexly curved in itself in its longitudinal direction in an arc shape towards the safety connector (1) immediately before it is placed on the safety connector (1).

7. Safety connector according to Claim 5 or 6, characterized in that, at at least one of the end faces, the cover (25) engages from the inside behind an outer wall (28) of the safety connector (1) in a locking manner.

8. Safety connector according to Claim 7, characterized in that, at the other end face, the cover (25) is pivotably mounted on the safety connector (1).

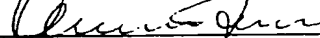
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9. A safety connector according to claim 1 or 4, substantially as hereinbefore described with particular reference to and as illustrated in the accompanying drawings.

Dated this the 27th day of June, 1990

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BY:  EXECUTIVE

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AGENTS FOR THE APPLICANT

FIG 1

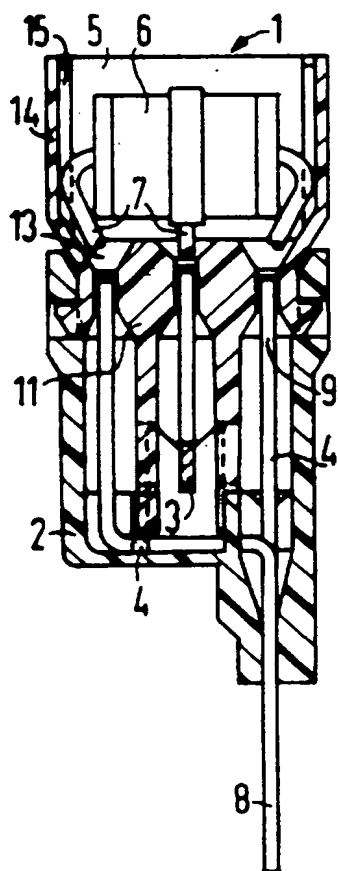


FIG 2

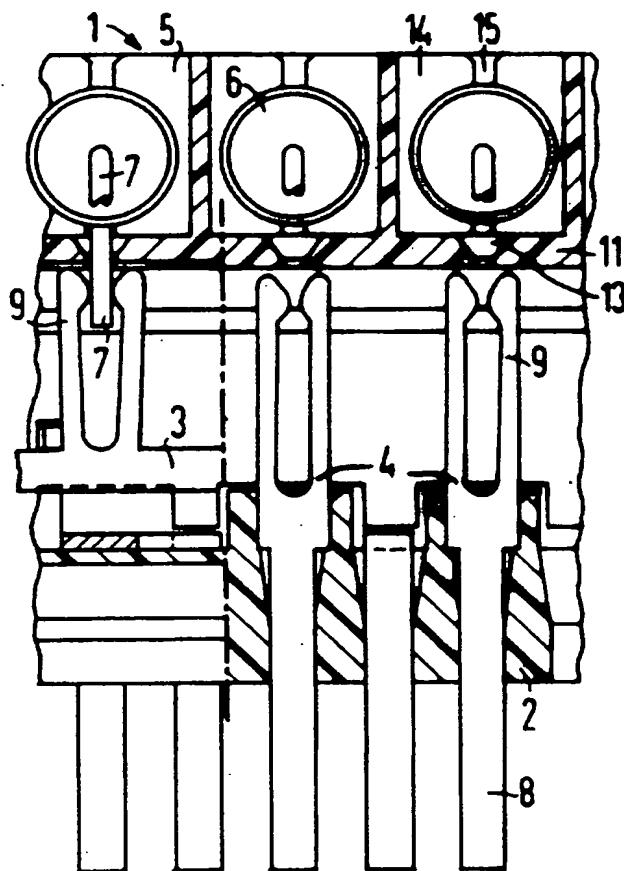
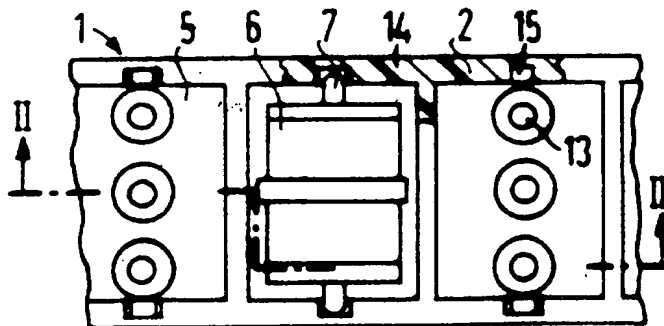


FIG 3



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FIG 4

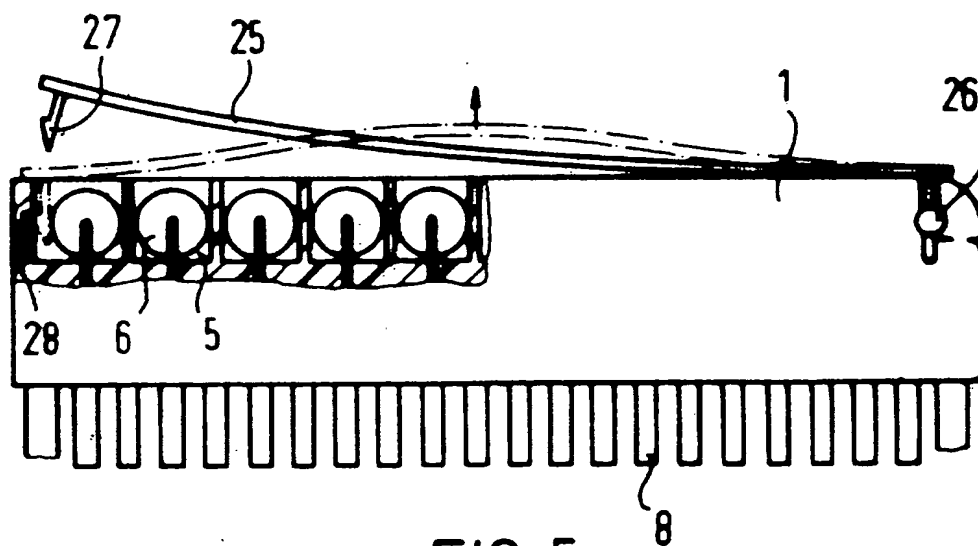
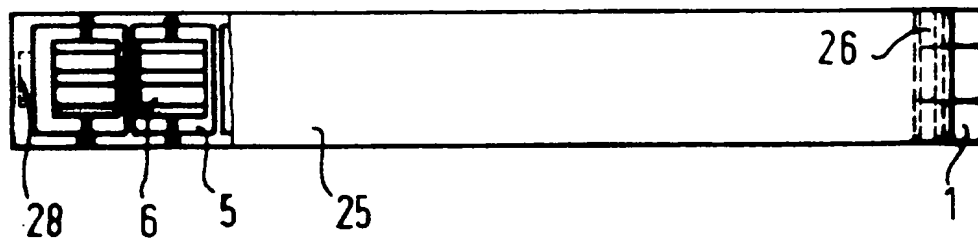


FIG 5



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